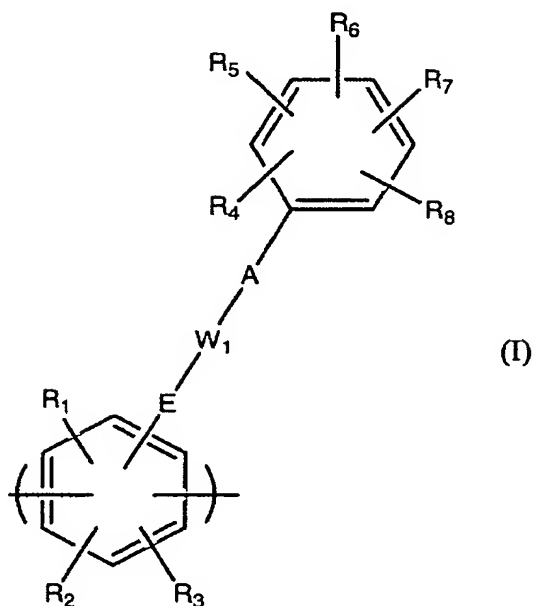
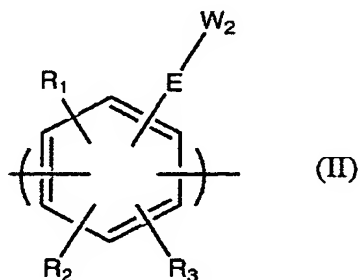


CLAIMS

1. A polymer, the skeleton of which consists of at least one phenylene repeating unit of formula (I) below:



and of at least one phenylene repeating unit of formula (II) below:



in which:

- the groups R_1 , R_2 and R_3 , which may be identical or different, represent a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a perfluoroalkyl group or a perfluoroaryl group;
- the group E represents a single bond or a group chosen from $-(C=O)-$, $-P(=O)-$ and $-SO_2-$;

- the group W_1 represents an arylene group or a perfluoroarylene group;
 - the group A represents a group chosen from -O-, -S-, -NH- and -NR₉-, R₉ being an alkyl group;
 - the group W_2 represents an aryl group substituted with at least one substituent chosen from F, -O-SO₂-Aryl, -S(=O)-Aryl or represents a perfluoroaryl group;
 - the groups R₄, R₅, R₆, R₇ and R₈, which may be identical or different, represent a group chosen from:
 - a hydrogen atom, a halogen atom, an -OH group, a group -M(R₁₀)₃ with R₁₀ representing an alkyl group and M a metal chosen from Si, Sn and Ge;
 - a group -P(=O)(OR₁₁)₂ with R₁₁ representing an alkyl group;
 - an aryl group, a group -O-Aryl, a group -SO₂-aryl, an alkylaryl group, a perfluoroalkyl group or a perfluoroalkylaryl group, said alkyl, perfluoroalkyl and perfluoroalkylaryl groups optionally comprising in their chain one or more oxygen, nitrogen and/or sulfur atoms;
 - a perfluoroaryl group or a group -O-perfluoroaryl, said perfluoroalkyl, perfluoroaryl, perfluoroalkylaryl and -O-perfluoroaryl groups optionally bearing a group chosen from -SO₃H, -PO₃H₂ and -CO₂H;
 - an -SO₃H group, a -PO₃H₂ group or a -CO₂H group;
- on condition that at least one of the groups R₄, R₅, R₆, R₇ and R₈ represents a group chosen from -SO₃H, -PO₃H₂ and -CO₂H groups, perfluoroalkyl groups, perfluoroalkylaryl groups optionally comprising in their chain one or more oxygen, nitrogen and/or sulfur atoms, perfluoroaryl groups and -O-perfluoroaryl groups, these perfluoro groups bearing a group chosen from -SO₃H,

-PO₃H₂ and -CO₂H,

said -SO₃H, -PO₃H₂ and -CO₂H groups possibly being in the form of alkali metal salts.

2. The polymer as claimed in claim 1, the molecular weight of which is greater than or equal to 50 000, preferably from 50 000 to 150 000.

3. The polymer as claimed in claim 1 or 2, in which the phenylene groups of the skeleton are in the para position relative to each other.

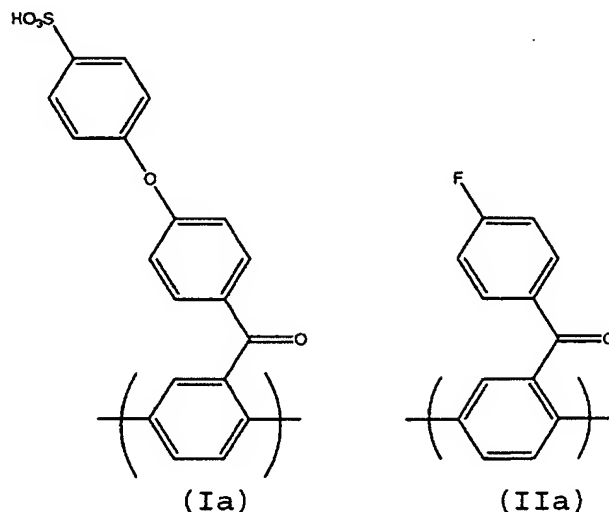
4. The polymer as claimed in any one of the preceding claims, which is a random, alternating or sequential polymer.

5. The polymer as claimed in any one of claims 1 to 4, comprising from 40 to 50 mol% of the repeating unit(s) of formula (I) and from 60 to 50 mol% of the repeating unit(s) of formula (II).

6. The polymer as claimed in any one of claims 1 to 5, in which at least one of the groups R₄, R₅, R₆, R₇ and R₈ represents a perfluoroalkyl group, comprising in its chain one or more oxygen, nitrogen and/or sulfur atoms, said group bearing a group chosen from -SO₃H, -PO₃H₂ and -CO₂H or its alkali metal salts.

7. The polymer as claimed in any one of claims 1 to 5, in which, for the repeating unit(s) of formula (I), at least one of the groups R₄, R₅, R₆, R₇ and R₈ represents a group chosen from -SO₃H, -PO₃H₂ and -CO₂H, and, for the unit(s) of formula (II), W₂ is an aryl group bearing a fluorine leaving group.

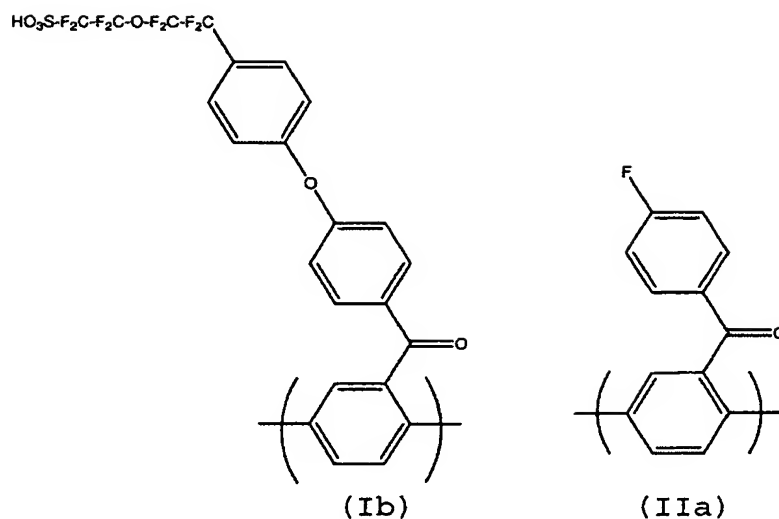
8. The polymer as claimed in claim 7, the skeleton of which consists of repeating units of formulae (Ia) and (IIa) below:



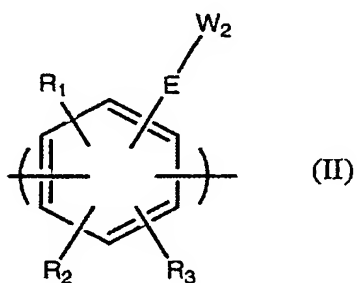
9. The polymer as claimed in any one of claims 1 to 6, in which, for the repeating unit(s) of formula (I), at least one of the groups R_4 , R_5 , R_6 , R_7 and R_8 represents a perfluoroalkyl group chosen from the groups having the following formulae:

$-(CF_2)_n-O-(CF_2)_n-SO_3H$, $-(CF_2)_n-SO_3H$, $-O-(CF_2)_n-SO_3H$,
 $-O-(CF_2)_n-O-(CF_2)_n-SO_3H$, n ranging from 1 to 10, and, for the repeating unit(s) of formula (II), W_2 represents an aryl group bearing a fluorine atom.

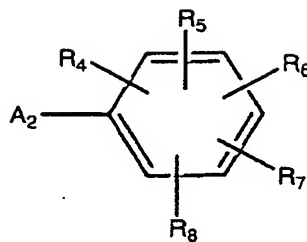
10. The polymer as claimed in claim 9, the skeleton of which consists of repeating units of formulae (Ib) and (IIa) below:



11. A process for preparing a polymer as claimed in claim 1 or 2, comprising the reaction of a base polymer whose skeleton consists of at least one repeating unit of formula (II) below:



in which R_1 , R_2 , R_3 , E and W_2 correspond to the same definition as that given in claim 1, with at least one compound of formula (III) below:



(III)

in which R₄, R₅, R₆, R₇ and R₈ are as defined in claim 1, the group A₂ is an OH, -SH, NH₂ or -NHR group with R corresponding to the same definition as R₉ of claim 1, said group A₂ being capable of effecting the aromatic nucleophilic substitution of a group borne by W₂, this group possibly being an F, -O-SO₂-Aryl or -S(=O)-Aryl group.

12. A membrane comprising the sulfonated polymer as claimed in any one of claims 1 to 10.

13. A fuel cell device comprising at least one membrane as claimed in claim 12.